



20 feet above the floor. It is expected that the mounting will be completed in April 1887, and that the glass will be brought to Mount Hamilton and put in place some time during the summer following. The total cost of the equatorial and dome will be about 164,850 dols.; the cost of the dome being 56,850 dols.; the mounting, 42,000 dols.; the visual objective, 53,000 dols.; the additional photographic lens, 13,000 dols.

WE have received a copy of the address of Sir William Manning, as Chancellor of the University of Sydney, at the annual commemoration. The report which it contains is one of progress in almost every direction. The death of Prof. Smith, who had long held the Chair of Experimental Physics, led to a re-arrangement of duties, a Professorship of Physics being substituted, with a wider and different range of teaching in Physical Science, including portions of the duties before discharged by the Professor of Mathematics as Professor also of Natural Philosophy. The list of private benefactions appended to the address is a remarkable one. It amounts to 317,414*l.* 12*s.* 6*d.* Of this, one amount, the Challis Bequest, is estimated at 180,000*l.*, and is anticipated to reach about 200,000*l.* As this noble donation has only recently fallen into possession, its application has not yet been fixed; the only point determined about it is that no part of it shall be used on buildings of any kind, but the capital shall be kept intact to produce an income for direct educational purposes. Another highly important gift is the Macleay Natural History Collection, valued at 25,000*l.* A building has been erected to receive the collection, and an endowment of 6000*l.* for a Curator has been promised. The other gifts include one of 30,000*l.* for the library. The amount of the donations since 1879 exceed a quarter of a million sterling—a magnificent sum for any community, however wealthy, to contribute in a few years to a single educational institution.

ON Thursday last week the Photographic Exhibition, promoted by the Glasgow Town Council, was opened in the Corporation Galleries with a numerously attended *conversazione*. It is the fullest exposition, historical, practical, and scientific, of the art of photography which has yet been given. By means of an admirable series of examples it illustrates the development of photography from the earliest attempts of Wedgwood, Niepce, Daguerre, Fox-Talbot, and numerous other discoverers, to the latest products of those who are acknowledged at the present day as masters of the art. In the department of photo-lithography the numerous methods of photo-engraving and photo-type-printing are fully represented by means of exhibits from the principal workers in that line. One of the most interesting sections is that which illustrates the applications of photography to the various branches of science, divided into its relations to geography, ethnology, microscopy, meteorology, and astronomy. In the last of these, the greatest of the recent triumphs in celestial photography by the Brothers Henry, of the Paris Observatory, are admirably shown; and there are also splendid examples of a similar kind from the Royal Observatory, as well as from Mr. A. Ainslie Common and others eminent in that field. The apparatus range from the primitive appliances of Daguerre to the latest ones of Messrs. Mason and Co., Glasgow; Mr. Stanley, London; and Mr. Marion, of the same city. Mr. James Paton, the curator of the galleries, has superintended the arrangements for the exhibition, which are of a most satisfactory nature.

WE regret to learn of the probable early recall of the Commissioner of the Philippine Forest Department, and the practical suspension of the work in which he is engaged. The step is much to be regretted on many grounds, and it is to be hoped the Spanish Government will re-consider its decision in the matter. Until recently our knowledge of Philippine vegetation was extremely scanty, notwithstanding the collections made by the late Mr. Hugh Cuming. Even these it remained for Don

Sebastian Vidal, Commissioner of Forests there, to place in accessible form, the materials for his recently-published "*Phanerogamæ Cumingianæ Philippinarum*" having been collected whilst engaged in working up his collections at Kew some two or three years ago. The extensive collections recently made by the Forest Department, a portion of which has been transmitted to Kew for determination, has, we believe, yielded a considerable proportion of novelties, including a number of genera not hitherto known from the islands. Information respecting these additions will probably be forthcoming in due course, as already we have an outline of the flora at the hands of one of the Kew staff. The above, together with the fact that the large island of Mindanao, and several others, is practically unexplored, shows how much yet remains to be done in this direction. From an economic stand-point, and for the development of the natural resources of the islands, the work of the department is an important one. The demand for timber, owing to the exhaustion of the forests in various directions, is assuredly forcing the forestry question into the foreground. As an example of how little we know of the Philippine flora, we may mention the *St. Ignatius's bean*, of which until recently nothing was known beyond the fact that it finds its way into the markets of this country as a source of the deadly poison strychnine, and was said to be sold in the market at Manila. Now, we believe, the plant has been discovered, and information respecting it will doubtless be shortly forthcoming. Such matters as these naturally engage the attention of the Forest Department, and it will be a matter for sincere regret if the work so well begun should come to a sudden termination, just at a time when its importance is beginning to be realised.

A PHILIPPINE correspondent, writing on May 24 last, informs us that the great volcano, Mayon, in the south of the Island of Luzon, is in eruption. He remarks:—"I tried the ascent, and climbed to about 5000 feet, when incandescent stones and ashes obliged me to come quickly down. I crossed a patch of forest—*Litsea verticillata*, *Myrica vidaliana*, and *Vaccinium* abundant—half burnt and covered with ashes. The sight was magnificent, but not much botanical work to be done there. I never saw anything like it as a sublime scene of devastation; ashes and stones and smoke everywhere, and a fearful noise like heavy artillery all around." *Myrica vidaliana*, it may be remembered, was described only about a year ago, from specimens collected at this very spot. At present it has not been found elsewhere, though it probably exists on other volcanic peaks in the island.

THE *Melbourne Argus* of June 11 gives some particulars of the eruption of Mount Tarawera, in New Zealand, which was briefly reported by telegram. The first news of the outbreak was received at Auckland from the telegraphist at Rotorua on the morning of June 10. He said:—"We have all passed a fearful night here. The earth has been in a continual quake since midnight. At 2.10 a.m. there was a heavy quake and a fearful roar, which made every one run out of their houses. A grand yet terrible sight for those so near as we were presented itself. Mount Tarawera, close to Lake Rotomahana, suddenly became an active volcano, belching out fire and lava to a great height. The eruption appears to have extended itself to several places southward. A dense mass of ashes came pouring down here at 4 a.m., accompanied by a suffocating smell as from the lower regions. An immense black cloud, which extended in a line from Tapeka to Pairua Mountain, was one continued mass of electricity all night, and is still the same. The thunder-like roaring of three or four craters, the stench, and the continual quaking of the earth, had the effect of completely frightening people." Things became so threatening that the telegraphist deemed it prudent to abandon his post; but he afterwards returned. At Wairoa the schoolhouse was fired by the light-

ning and smothered in mud and stones, and two hotels were reduced to ruins. Twenty bodies were recovered. For about six miles north of Te Awamutu the whole of the surrounding country was covered with blue mud 3 feet deep. It was reported that all Rotomahana had disappeared. Many natives lost their lives; but the exact number is not known. The sounds of the explosion were heard at Hamilton, about eighty miles distant, early in the morning. They were like great guns at sea. The windows of houses in Hamilton were shaken. At Maketu there was darkness until 10 a.m. The earthquakes lasted from 2.30 a.m. till 8.15, with very strong lightning and earth-currents. Four volcanoes were going at Wairoa. The Tikitapu bush has been uprooted. All the country down to Tauranga was in total darkness, with thick clouds of sulphurous matter and gypsum in the air. The following description of the scene was given in a message from Taupo:—"At 3 a.m. a terrific report aroused the sleeping inhabitants of Taupo, when an immense glare of a pillar-shaped light was observed to the north-north-east. A great black cloud hung over this pillar, concave on the under-side, and convex on the upper, whilst meteors on all sides shot out from the cloud in every direction, shedding an unearthly bluish light. Loud reports, accompanied by very heavy shocks of earthquake, followed in quick succession, and kept on until 6 o'clock, when the daylight and the clouds of ashes rendered the sight invisible. At 2.15 a.m. the two extinct volcanoes of Ruawhai and Tarawera threw an immense column of flame and smoke into the heavens. Molten lava and hot mud were rained abroad, while huge rocks and masses of fire went up and around in all directions. The earthquakes were terrible. Tongariro is quiet. Heavy snow is falling on the ranges and the cold is intense. The rumbling still continues at Maketu, and dust is still falling. The whole country is covered from 1 to 6 inches with dust."

THE series of anthropoid apes at the Zoological Society's Gardens at the present time is well worthy of attention. Besides "Sally," the bald-headed chimpanzee (*Anthropopithecus calvus*), which has now been two years in the Regent's Park, there is a second chimpanzee of the ordinary species (*A. troglodytes*), which enables these two forms to be compared side by side. A young orang (*Simia satyrus*) has likewise recently arrived, and a white-handed gibbon (*Hylobates lar*), from Malacca, deposited by Mr. Dudley Hervey, Resident Councillor of the Straits Settlements, exemplifies the third type of the highest division of the Quadrumana. It is much to be wished that the long-talked-of plan of building a new compartment by the side of the existing monkey-house for the Anthropoids could be carried out. At present these highly interesting animals are not very conveniently lodged along with the sloths and ant-eaters, on the other side of the Gardens.

THE half-yearly general meeting of the Scottish Meteorological Society will be held to-day, when the following papers will be read:—"The Extent of the Areas of the different Mean Annual Rainfalls over the Globe," by Mr. John Murray; "On the Temperature of the Water in the Firth of Clyde and connected Lochs," by Dr. Hugh Robert Mill, F.R.S.E.

MR. FRANK E. BEDDARD, Prosector of the Zoological Society, has been appointed Lecturer on Biology at Guy's Hospital.

ACCORDING to the programme of the approaching celebration of the 500th anniversary of the foundation of Heidelberg University, a grand historical procession designed and to be personally directed by Prof. Carl Hoff, of the Karlsruhe School of Art, will march through the town on August 6, starting at 9 a.m. More than 900 persons with 300 horses and 14 state coaches will take part in the procession, which is to give a pictorial representation of the five centuries which have succeeded

the foundation of the University, and to comprise the following groups:—(a) Founding of the University by Elector Ruprecht I., 1386; (b) public entry of Frederick the Conqueror after the battle of Seckenheim, 1462; (c) nurture of science and art by Elector Otto Heinrich, 1556–59; (d) life among the people of the Merry Palatinate at the end of the 16th century: procession illustrating the vintage of the Palatinate; (e) entry of the Elector Frederick V. with his consort, Elizabeth of England, June 17, 1613; (f) Bohemian Embassy, 1619; (g) time of the Thirty Years' War (1618–48), and of the War of the Orleans Succession (1688–97); (h) Elector Karl Ludwig, with retinue, 1632–80; (i) time of the Elector Karl Philipp, 1716–42: hunting cavalcade; (k) Elector Karl Theodor, 1742–99; (l) Restoration of the University by Karl Friedrich of Baden, 1803: the students of the nineteenth century; (m) the Burschenschaften; (n) the Corps; (o) the new German Empire. Judging by the arrangements now nearly completed, the procession may be expected to surpass all previous exhibitions of the kind in the splendour of its equipage and the historical truth of its representation, which will be carried into even its minutest details. For the sake of a proper view of the procession, stands are to be erected at all convenient points along the line of the procession, and the sale of tickets for the numbered seats of the stands has already begun. A plan of the procession, issued by the firm Koester, Heidelberg, (price 20 Pfennige) shows the arrangement of the stands, with the prices of the various seats, and gives information respecting hotel accommodation, &c. A very considerable number of lodgings, we learn, have already been engaged by strangers intending to be present at the ceremonies connected with the celebration. All intending visitors who have not yet secured accommodation in respect of board and lodging are invited to make early application to the Commission specially appointed for the negotiation of such business—Wohnungs Commission, Rathhaus, Heidelberg. Beds are still to be had at the moderate price of 15 marks for the whole term of the celebration, while hotel-keepers, &c., have publicly engaged to keep their prices within strictly reasonable limits.

AT the Conference of the Colonial and Indian Exhibition, held on the 30th ult., Prof. Frearm read a paper on "Colonial Forestry," dealing with the present condition of forestry in the larger colonies. In Canada there is need of conservation and of tree-planting, and everything now seems ripe for the establishment of a department of forest conservancy in the Dominion. In New South Wales such a department is at work under the Ministry of Mines; in Victoria a considerable area is reserved, but even this is not commensurate with the demand for timber for industrial purposes. In South Australia, Queensland, and New Zealand, efficient forestry departments exist. In Australia and the Cape Colony, English forest trees are being successfully cultivated, and "in all the colonies the reckless waste and wanton destruction of former days have given place to wise systems of conservancy, such as are worthy of a tree-loving people."

A SERIES of photographic views from a balloon has been taken by M. Nadar, of Paris, whose father, twenty-five years ago, was the first to attempt photographing from a balloon, with only partial success. The stereotype plates of the views taken were presented to the Academy of Sciences at their meeting on July 12.

SEVERAL attempts have lately been made by the Marquis of Lorne to transmit live whitefish (*Coregonus albus*), which have been reared by the National Fish Culture Association, to the Isle of Mull, where his lordship is endeavouring to acclimatise this valuable American species. After several futile attempts two consignments of them have reached their destination in safety. Great difficulty attends the operation of removing white



fish from one place to another. The best carrier for removing them in is an ordinary carboy filled to the top with water. Not more than fifty specimens of yearling fish should be placed in one carrier. The autumn is the best time for transmitting them.

We are informed by Mr. W. August Carter, of the Colonial and Indian Exhibition Fisheries Section, that a large specimen of a smooth hound, recently imported into the aquarium of the Exhibition from Brighton, gave birth last week to ten young ones, this species being viviparous. She did not deliver them simultaneously, but two at a time, at intervals of about twenty hours, occupying six days in yielding the entire number. All the young on appearing were perfectly formed, and resembled in every respect their matured congeners with the exception of the colour of the upper portion of the body and fins, which was white throughout instead of grey. Unfortunately nine expired shortly after birth, lacking the conditions necessary to their existence, such as deep water, where in their natural state they always remain for six months during their alevin stage. The remaining fish was devoured by its parent, which is in excellent condition and moves actively around the tank.

FROM the report of the Stockholm Observatory for the last year, we learn that during the year Prof. Gylden continued the calculations for the development of certain theories respecting the chief planets, and that they are so far advanced as to already embrace the terms of the first and second orders in relation to the masses pertaining to the theory for the system Jupiter-Saturn-Uranus. The Astronomer-Royal also continued his lectures on theoretical astronomy, chiefly supported by King Oscar, which were attended by several eminent foreign astronomers. Several well-known astronomers from Russia and Germany have also pursued their studies at the observatory during the year, two of whom, Drs. Shdanow and Harzer, of Pulkowa, having, as the result of the same, published important papers on the astronomical theory of perturbation. Three more parts of the work, "Astronomical Observations and Researches at the Stockholm Observatory," were issued during the year.

BEFORE adjourning this summer the Swedish Parliament granted a sum of 325*l.* towards the continuation of the *Acta Mathematica* during the ensuing financial year 1886-87.

WE have received Nos. 45-47 of the first part, 34-36 of the second part, of the well-known and valuable "Encyclopædia of Natural Sciences," now in course of publication by the house of Eduard Trewendt, of Breslau. The three numbers of the first part include the seventeenth number of the "Manual of Botany," containing the beginning of an important note by Prof. Oscar Drude, of Dresden, on "The Systematic and Geographical Arrangement of the Phanerogams," illustrated with finely executed drawings by the author, and a map. The two other numbers belong to the "Alphabetical Manual of Zoology, Anthropology, and Ethnology," advancing that work from "Kalunda" to "Landrace." Nos. 34 and 36 of the second part carry on the "Alphabetical Manual of Chemistry" from "Essigsäure" to "Furfurgruppe." Of special interest is the excellent work by Dr. R. Nietzki, of Basel, on "Organic Colouring Materials." The 35th number, again, brings us nearer to the conclusion of the "Alphabetical Manual of Mineralogy, Geology, and Palæontology," containing, as it does, palæontological contributions by Dr. Fr. Rolles—Trias System, Birds, Wanderings of Plants and Animals in the Course of Geological Epochs, Mollusks, and Worms, as also mineralogical contributions by the Editor. The few articles that still remain to be written on geology, interrupted by the sudden death of Prof. von Lasaulx, will be taken up by Prof. Hoernes, of Graz, so that this "Handwörterbuch" will be completed in the course of this summer.

THE Prince of Monaco has left Lorinet with his yacht *Hirondelle* to prosecute the series of marine observations begun last year. The cruise will be made between Cape Finisterre and the English southern coast. Five hundred tubes have been prepared, and will be thrown on the sea. They will carry printed forms of the same kind described on a former occasion. Dredgings and thermometric readings will be made on the bottom of the sea.

THE administration of the Jardin des Plantes of Paris has organised an exhibition of the objects collected on the Congo by M. Savorgnan de Brazza.

THE Franco-Algerian telegraph system is being completed to Biskra, but the communication between Biskra and Tugurth and Dabila oasis, situated at a great distance to the south, is kept up by means of the optical telegraph, the sun being utilised in daytime, and at night electricity. The optical system will be always kept in operation, as it is apprehended that nomads might cut the wires.

THE Kazan Society of Naturalists has issued the fourteenth volume of their *Memoirs (Trudy)*, which contains a very interesting paper, by MM. Stuckenberg and Vysotski, on the Stone Age at Kazan. The commencement of a museum of Stone Age implements at Kazan was made in 1877, and now it already has a first-rate collection, both in the number and variety of implements, and M. Zausailoff is publishing a beautiful atlas of drawings representing them. The paper of MM. Stuckenberg and Vysotski contains most interesting details as to the places where remains of man were found, illustrated by three maps. Three different terraces are seen in the valley of the Volga. The upper terrace, rising 50 to 150 feet above the second, consists of yellow-brownish sandy clay, covering layers of sand. It contains remains of mammoths and other extinct mammals. The second terrace is much more recent; and it is on its surface, as well as on the slopes of the former, and sometimes on the surface of the third terrace, that the stone implements are found. The third terrace, which is still inundated by the Volga, was probably almost covered by its waters during the Stone Age. All implements found are Neolithic; that is, they belong to what we should call the lacustrine period. As to the implements themselves, many of which are figured on the sixteen plates which accompany the paper, they have mostly been made of the local flint originating from the Permian deposits. A few are made of the Eocene sandstone which extends to the south of the Kazan Government; and, finally, boulders of granite, diorite, gneiss, quartzite, and so on, have also been used for the fabrication of some of the hammers. Broken pottery, together with bones of horses, oxen, and pigs, accompany the stone implements.

M. PALMIERI, the director of the Vesuvian Observatory, has succeeded in exhibiting the negative electricity developed when steam is condensed by cold, and positive electricity liberated when evaporation takes place. A platinum shell is placed in communication with one of the plates of a condenser. The golden leaf is separated when a piece of ice is placed in the shell, and also when it is full of water if exposed to the rays of the sun. The electricity has been proved positive in the first instance, and negative in the second.

DURING the last few weeks great tracts of the fertile island of Seeland, in Denmark, have been devastated by maybugs, whole fields and meadows having been laid quite bare. Last year the damage done was very great, but this year it is far worse, being estimated at some 25,000*l.* The distress among farmers is in consequence very great.

A MIRAGE was observed at Algiers prior to the outbreak of the destructive thunderstorm which broke over the city on the 7th

inst. Cape Matifan appeared from Algiers close at hand with a sharply cut rock of granite at its extremity. The temperature was  $43^{\circ}2$  C. in the shade, showing that the air above the sea was very hot, and that the explanation of the phenomenon is to be found in the same causes as those determining a mirage in the Sahara. The lowering of the temperature was very rapid, falling as much as  $2^{\circ}$  C. at Bouzarcah Observatory. The 7th inst. was the hottest day that has yet been felt there this season. Lightning struck the Government barrack at Mustapha, and ignited piles of hay, inflicting damage to the extent of 4000l.

THE additions to the Zoological Society's Gardens during the past week include a Rhesus Monkey (*Macacus rhesus*) from India, presented by Mr. F. W. Steward; a Ring-tailed Lemur (*Lemur catta*) from Madagascar, presented by Mrs. Collcutt; six Prairie Marmots (*Cynomys ludovicianus*) from North America, presented by Mr. F. J. Thompson; two Common Foxes (*Canis vulpes*) from Russia, presented by Mr. Harrison Cripps, F.R.C.P.; a Common Rhea (*Rhea americana*) from South America, presented by Mr. J. W. Bell; four Red-bellied Squirrels (*Sciurus variegatus*) from Trinidad, presented by Mr. R. J. Lichmere Guppy; two Peba Armadillos (*Tatusia peba*) from South America, presented by Mr. J. Clements; a Greater Black-backed Gull (*Larus marinus*), British, presented by Mr. Henry Stevens, M.D.; twenty-four Sand-Lizards (*Lacerta agilis*), a Slowworm (*Anguis fragilis*), a Common Snake (*Tropidonotus natrix*) from Germany, presented by Mr. S. Schaefer; two Sarus Cranes (*Grus antigone*) from North India, eight European Tree Frogs (*Hyla arborea*) from Germany, purchased; two Long-fronted Gerbilles (*Gerbillus longifrons*), an Elliot's Pheasant (*Phasianus ellioti*), a Bronze-winged Dove (*Phaps chalcoptera*), a Barred-shouldered Dove (*Geopelia humeralis*), bred in the Gardens.

### OUR ASTRONOMICAL COLUMN

SCHULHOF'S RESEARCHES ON THE ORBIT OF COMET 1873 VII. (COGGIA—WINNECKE).—The elements of Comet 1873 VII. bear a certain resemblance to those of Comet 1818 I., which was observed by Pons. Prof. Weiss asserts the identity of these two comets, and adopts sixty-two years as the most probable value of the period of revolution. In the *Bulletin Astronomique*, tome iii. p. 125 *et seq.* M. L. Schulhof has published a most exhaustive discussion of the orbit of Comet 1873 VII., and has gone into the question of its possible identity with 1818 I., as well as with 1457 I. (the observations of which by Toscanelli have recently been discussed by Prof. Celoria) in a most thorough manner. The opinion which he expresses, with some reserve, as the result of his investigations, is that the Comets 1873 VII. and 1818 I. are distinct bodies with a short period of revolution, having a common origin. The Comet 1457 I. is probably identical with 1873 VII., but it is also possible that the two comets, 1873 VII. and 1818 I. are fragments of 1457 I., which must have been a much more conspicuous object than either of them, to have been seen by Toscanelli and by the Chinese with the naked eye.

SOLAR ACTIVITY DURING THE FIRST HALF OF 1886.—The numbers and areas of sunspots have shown upon the whole a decided falling off during the past half-year as compared with the last six months of 1885, although no month of the present year has shown so low a daily average as December 1885. There has been, however, a steady increase in the number of days on which the sun's disk was free from spots, one side of the sun being, on the average, much less spotted than the other, causing an apparent short period in the variation of the spotted area, of about a synodic rotation of the sun in duration. The month in which the mean daily number of sunspots was least was February; that in which it was most was March. An exceedingly fine group was observed on May 8.

Prominences have shown fewer fluctuations in their numbers and size, but have been fully one-fourth less numerous on the average than in 1885.

### ASTRONOMICAL PHENOMENA FOR THE WEEK 1886 JULY 25-31

(FOR the reckoning of time the civil day, commencing at Greenwich mean midnight, counting the hours on to 24, is here employed.)

At Greenwich on July 25

Sun rises, 4h. 15m.; souths, 12h. 6m. 14'6s.; sets, 19h. 57m.; decl. on meridian,  $19^{\circ} 38'$  N.: Sidereal Time at Sunset, 16h. 11m.

Moon (one day after Last Quarter) rises, 23h. 35m.\*; souths, 6h. 39m.; sets, 13h. 54m.; decl. on meridian,  $11^{\circ} 23'$  N.

Planet	Rises h. m.	Souths h. m.	Sets h. m.	Decl. on meridian
Mercury	... 6 50 ...	13 46 ...	20 42 ...	$10^{\circ} 6'$ N.
Venus	... 1 37 ...	9 46 ...	17 55 ...	$22^{\circ} 22'$ N.
Mars	... 10 59 ...	16 35 ...	22 11 ...	$5^{\circ} 18'$ S.
Jupiter	... 9 47 ...	15 54 ...	22 1 ...	$0^{\circ} 32'$ N.
Saturn	... 2 43 ...	10 51 ...	18 59 ...	$22^{\circ} 15'$ N.

\* Indicates that the rising is that of the preceding evening.

### Occultations of Stars by the Moon (visible at Greenwich)

July	Star	Mag.	Disap.	Reap.	Corresponding angles from vertex to right for inverted image
27 ... 85	Tauri	... 6 ...	h. m. ...	h. m. ...	$90^{\circ} 224^{\circ}$
27 ... $\sigma^2$	Tauri	... 5 ...	3 6 ...	3 43 ...	$10^{\circ} 297^{\circ}$
27 ... $\sigma^1$	Tauri	... $5\frac{1}{2}$ ...	3 23	near approach	$334^{\circ}$ —
July	h.				
25 ... 5	...	Mercury at greatest distance from the Sun.			
28 ... 22	...	Venus in conjunction with and $0^{\circ} 6'$ south of $\mu$ Geminorum.			
28 ... 23	...	Venus in conjunction with and $3^{\circ} 46'$ north of the Moon.			

### Variable Stars

Star	R.A.	Decl.	h. m.
U Cephei	... 0 52'2 ...	$81^{\circ} 16'$ N.	July 28, 22 51 m
Algol	... 3 0'8 ...	$40^{\circ} 31'$ N.	... 28, 1 47 m
			... 30, 22 36 m
$\delta$ Libræ	... 14 54'9 ...	$8^{\circ} 4'$ S.	... 31, 21 22 m
R Scorpii	... 16 10'9 ...	$22^{\circ} 40'$ S.	... 31, M
U Ophiuchi	... 17 10'8 ...	$1^{\circ} 20'$ N.	... 27, 23 52 m
W Sagittarii	... 17 57'8 ...	$29^{\circ} 35'$ S.	... 26, 0 0 m
$\beta$ Lyræ	... 18 45'9 ...	$33^{\circ} 14'$ N.	... 26, 2 0 m <sub>2</sub>
$\eta$ Aquilæ	... 19 46'7 ...	$0^{\circ} 43'$ N.	... 25, 0 0 M
$\delta$ Cephei	... 22 24'9 ...	$57^{\circ} 50'$ N.	... 25, 21 30 M

M signifies maximum; m minimum; m<sub>2</sub> secondary minimum.

### Meteor Showers

The principal shower is that of the *Aquarids*, maximum July 28; radiant R.A.  $340^{\circ}$ , Decl.  $13^{\circ}$  S. Other showers are as follows:—The *Andromedes* (I.), R.A.  $8^{\circ}$ , Decl.  $36^{\circ}$  N.; near  $\chi$  Persei, R.A.  $32^{\circ}$ , Decl.  $53^{\circ}$  N.; near  $\beta$  Ursæ Majoris, R.A.  $165^{\circ}$ , Decl.  $53^{\circ}$  N.; and near the Pole, R.A.  $300^{\circ}$ , Decl.  $87^{\circ}$  N.

### ON LAYING THE DUST IN MINES

IN a paper recently contributed to the South Wales Institute of Engineers,<sup>1</sup> Mr. Archibald Hood, the President, says:—

"It was probably first suggested by Faraday and Lyell about the year 1845 that coal-dust was in some way inflammable. This idea was subsequently set forth by several French engineers, but all that was done previous to the year 1875 bears the same relation to subsequent demonstrations as the steam-engine of Hero of Alexandria bears to the steam-engine of the nineteenth century."

Assuming Mr. Hood's date to mark correctly the commencement of the real battle between the new theory and its predecessors, it cannot surely be urged that the period of ten years which has since elapsed has been too long wherein to destroy the vast herd of previously existing chimeras, and to introduce and establish a new and different order of ideas. Doubtless the result attained up to the present has been prodigiously accelerated by the labours of the Royal Commission on Accidents in Mines, and of the

<sup>1</sup> "On the Watering of Dusty Mines." The South Wales Institute of Engineers, March 18, 1886.